

WHAT IS CLAIMED IS:

1 1. An impeller for pumping molten metal including a
2 body having a longitudinal axis, an end surface transversely
3 intersecting said axis, a peripheral surface extending about
4 said axis, and a plurality of elongate pumping chambers
5 extending in said body at angularly spaced locations about
6 said longitudinal axis, each of said pumping chambers having
7 a length extending along said peripheral surface and a width
8 extending transverse to said length, said pumping chamber
9 having an inlet opening formed in said end surface and an
10 outlet opening formed in said peripheral surface, said
11 pumping chamber length and width being in a ratio of less
12 than 3:1.

1 2. An impeller as in claim 1, wherein said ratio is
2 from less than 3:1 to 1:1 or less.

1 3. An impeller as a claim 1, wherein said impeller has
2 a direction of rotation in which it is adapted to be driven
3 and said pumping chamber includes a chamber surface that
4 extends at an angle inclined into said direction of rotation
5 whereby said chamber surface provides axial pumping upon
6 rotation of said impeller.

1 4. An impeller as in claim 1, wherein said outlet
2 opening extends along substantially the entire length of
3 said pumping chamber.

1 5. An impeller as in claim 4, wherein said body has a
2 longitudinal dimension and said pumping chamber length
3 extends along 10 to 100% of said longitudinal dimension of
4 said body.

1 6. An impeller as in claim 5, wherein said pumping
2 chamber length extends along 20 to 85% of said longitudinal
3 dimension of said body.

4 7. An impeller as in claim 1, wherein said body has a
5 radial dimension and said pumping chamber is located
6 substantially entirely in the radially outermost 1/3 of said
7 radial dimension of said body.

1 8. An impeller as in claim 4, wherein at least one
2 communicating bore extends through said body connecting said
3 pumping chambers.

1 9. An impeller as in claim 4, wherein a plurality of
2 communicating bores extend through said body connecting said
3 pumping chambers.

1 10. An impeller as in claim 4, wherein at least one
2 bore extends from said pumping chamber through said body to
3 a surface of said body remote of said end surface and said
4 peripheral surface.

1 11. An impeller as in claim 10, wherein said body
2 includes a second end surface axially spaced from said first
3 mentioned end surface and a shaft opening including a shaft

4 receiving surface, and said remote surface is one of said
5 second end surface and said shaft receiving surface.

1 12. An impeller as in claim 4, wherein said body has a
2 cylindrical shape including a first radial end forming said
3 end surface, a second radial end forming an opposed second
4 end surface and a cylindrical surface extending between said
5 first and second radial ends forming said peripheral
6 surface.

1 13. An impeller as in claim 4, wherein at least one
2 bore extends from at least one of said pumping chambers
3 through said body to a surface of said body remote of said
4 end surface and said peripheral surface.

1 14. An impeller as in claim 12, wherein a plurality of
2 communicating bores extend through said body connecting said
3 pumping chambers.

1 15. An impeller as in claim 4, wherein said pumping
2 chamber length extends along said peripheral surface at an
3 angle with respect to said longitudinal axis.

1 16. An impeller as in claim 15, wherein said impeller
2 has a direction of rotation in which it is adapted to be
3 rotatably driven and said angle is inclined into said
4 direction of rotation.

1 17. An impeller as in claim 16, wherein said angle is
2 between 0 and 45 degrees.

1 18. An impeller as in claim 16, wherein said pumping
2 chamber length extends in a linear direction.

1 19. A molten metal pump comprising an elongated shaft
2 having a first end connected to a driving means and a second
3 end connected to an impeller, said impeller being disposed
4 in a pump housing having a housing inlet through which
5 molten metal may be drawn and a housing outlet through which
6 molten metal may be discharged, said impeller including a
7 body having a longitudinal axis, an end surface transversely
8 intersecting said axis, a peripheral surface extending about
9 said axis, and a plurality of elongate pumping chambers
10 extending in said body at angularly spaced locations about
11 said longitudinal axis, each of said pumping chambers having
12 a length extending along said peripheral surface and a width
13 extending transverse to said length, said pumping chamber
14 having an inlet opening formed in said end surface and an
15 outlet opening formed in said peripheral surface, said
16 pumping chamber length and width being in a ratio of less
17 than 3:1.

1 20. A pump as set forth in claim 19, wherein said
2 pumping chambers are located in the outermost 1/3 of said
3 body.